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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,366	11/13/2003	Christoph A. Wasshuber	TI-36280 (032350.B536)	1864
23494	7590	02/22/2006	EXAMINER	
TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			NGUYEN, THINH T	
			ART UNIT	PAPER NUMBER
			2818	

DATE MAILED: 02/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/714,366

Applicant(s)

WASSHUBER, CHRISTOPH A.

Examiner

Thinh T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 and 21-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 21-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>5/14/2004</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

1. This is in response to Applicant's Amendment filed 9/19/2005 and 12/05/2005

Note that the figures and reference numbers referred to in this Office Action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

2. Applicant's election of claims 1-9,21-23 for prosecution without traverse in the communication with the Office on 12/05/05 is acknowledged.

3. Applicant's amendments to independent claim 1 have necessitated new grounds of rejection for claims 32-40 and 70-86. See MPEP § 706.07(a).

4. The Examiner noted that claims 1-9,21-23 are hybrid product by process for some of the limitations recited in those claims for example in claim 1: --"the active region **formed by epitaxially grown** substrate material. "-- this limitation "**formed by epitaxially grown.**" is taken to be a product by process limitation and considered *non-limitation*. In a product-by-process claim, it is the patentability of the claimed product and not of the recited process steps, which must be established. Therefore, when the prior art discloses a product, which reasonably appears to be identical with or only slightly different than the product claimed in a product-by process claim, a rejection based on sections 102 or 103 is fair. The Patent Office is not equipped to manufacture products by a myriad of processes put before it and then obtain prior art product and make physical comparisons therewith. In re Brown, 173 USPQ 685 (CCPA

1972). Also, a product by process claim directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ I S at 17 (footnote 3). See In re Fessman, 180 USPQ 324, 326 (CCPA 1974); In re Marosi et al., 218 USPQ 289, 292 (Fed. Cir. 1983); and particularly In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final structure of the product "gleaned" from the process steps, which must be determined in a "product by process" claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old and obvious product produced by a new method is not a patentable product, whether claimed in "product by process" claims or not.

Note that a "product by process" claim is directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); In re Marosi et al, 218 USPQ 289; and particularly In re Thorpe, 227 USPQ 964, all of which make it clear that it is the patentability of the final product per se which must be determined in a "product by process" claim, and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw makes clear.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. §102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 1, 3-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Gardner et al. (US patent 6,362,510) .

#### REGARDING CLAIM 1

Gardner discloses ( the abstract, fig 3,fig 7,fig 9) semiconductor device. comprising a substrate layer; ( fig 9 ref 100) first and second isolation regions formed by etching an oxide layer provided on the substrate layer ( fig 9, ref 102) to define an epitaxial growth surface of the substrate layer for epitaxial growth of a substrate material on the epitaxial growth surface between the 1st and second isolation regions; and an active region comprising the epitaxially grown substrate material between the first and second isolation regions. the active region formed by epitaxially growing the substrate material on the epitaxial growth surface ( fig 9 ref 116) of the substrate layer, said epitaxially-grown substrate material having a tailored dopant profile ( column 10 lines 1-26) through-out a depth of the epitaxially grown substrate material.

Noted that as discussed in paragraph 3 of the Office Action any product by process limitation will not be considered.

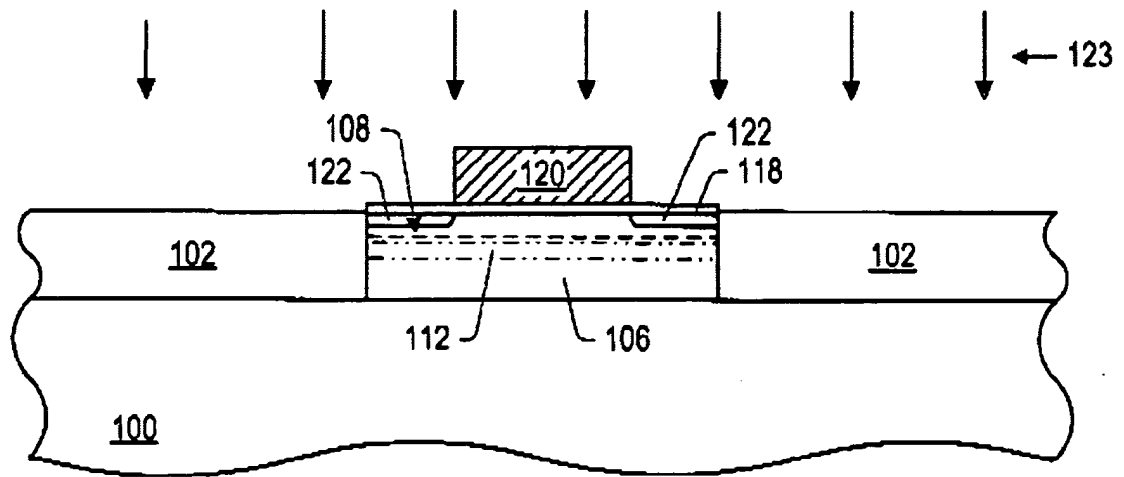


FIG. 9

### REGARDING CLAIM 3

Gardner discloses ( the abstract, fig 3,fig 7,fig 9 column 10 lines 1-26) a semiconductor structure use in manufacturing wherein the epitaxially-grown substrate material comprises dopant material introduced into the epitaxially-grown substrate material as the epitaxially-grown substrate material is grown on the epitaxial growth surface of the substrate layer.

Noted that as discussed in paragraph 3 of the Office Action any product by process limitation will not be considered.

### REGARDING CLAIM 4

Gardner (the abstract, fig 3,fig 7,fig 9, in the Background of the invention ) disclose one common structures of a plurality of active VLSI transistors built on the same substrate.; these structures will inherently have a second active regions and a third isolation regions

Noted that as discussed in paragraph 3 of the Office Action any product by process limitation will not be considered.

REGARDING CLAIM 5

Gardner disclose a device ( fig 6) that has an implanted and annealed structure

Noted that as discussed in paragraph 3 of the Office Action any product by process limitation will not be considered.

*Claim Rejections - 35 USC § 102*

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. §102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

8. Claim 1, 2,6,21-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Hsu et al. (US patent 6,903,3840) .

REGARDING CLAIM 1

Hsu discloses ( the abstract, fig 2) semiconductor device. comprising a substrate layer; ( fig 2 ref 102) first and second isolation regions formed by etching an oxide layer provided on the substrate layer to define an epitaxial growth surface of the substrate layer for epitaxial growth of a substrate material on the epitaxial growth surface between the 1st and second isolation regions; and an active region comprising the epitaxially grown substrate material between the

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first and second isolation regions. the active region formed by epitaxially growing the substrate material on the epitaxial growth surface of the substrate layer, said epitaxially-grown substrate material having a tailored dopant profile ( column 5 line 49-50) through-out a depth of the epitaxially grown substrate material.

Noted that as discussed in paragraph 3 of the Office Action any product by process limitation will not be considered.

#### REGARDING CLAIM 2

Hsu (fig 1,fig 2) disclose a semiconductor structure wherein the isolation regions and the active region are formed independent of any shallow trench isolation (STI) process in which an isolation region is formed by etching a trench in the substrate layer and filling the trench with an oxide material to define an adjacent active region of the structure.

#### REGARDING CLAIM 6

Hsu ( the abstract, fig 1, fig 2, column 2 line 19) disclose a structure of CMOS device.



2

PMOS

200

208

206

214

202

SOURCE

GATE

DRAIN

DRAIN

GATE

SOURCE

104 N-WELL SiGe

116 STI

P-WELL SiGe

SILICON

SILICON

212

N OR P-TYPE SILICON 102

100

204

210

g. 3

This cross-sectional diagram shows two transistors on a substrate. The left transistor has a gate stack 204 on a base 104, with a channel region 200 and a source/drain region 208. The right transistor has a gate stack 212 on a base 108, with a channel region 202 and a source/drain region 210. A central STI region 116 separates the two transistors. Various layers and regions are labeled with numbers: 104, 108, 112, 114, 116, 200, 202, 204, 206, 208, 210, 212, 214, 300, 302, 304, 306, 308, 310. Electrical contacts are shown at the top, connected to gates (Vg), sources (Vs), and drains (Vd). A substrate contact VO2 is connected to Vsub at the bottom.

REGARDING CLAIM 21,22,23

Hsu ( the abstract, fig 1,fig 3, fig 2,column 2 line 18-22), disclose a semiconductor structure, wherein: the active region comprises a first active region and the epitaxially-grown substrate material comprises a first epitaxially-grown substrate material; and the structure further comprises a third isolation region of the oxide layer; and a second active region comprising a second epitaxially-grown substrate material, different from said first epitaxially-grown substrate material, said second active region located between the second and third isolation regions. wherein said epitaxially-grown substrate material comprises a different chemical composition ( SiGe ) from said substrate ( silicon substrate ) and wherein said epitaxially-grown substrate material comprise a germanium dopant to affect the strain of said epitaxially-grown substrate material.

*Claim Rejections - 35 USC § 103*

9. The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 7,8,9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner et al. (US patent 6,362,510) in view of Natzle et al. (US patent 6,774,000).

REGARDING CLAIM 7,8,9

Gardner et al. disclose all the invention including a pad layer ( layer 118) with gate formed on pad layers and isolation layers formed on each side of the gate.

Missing in the disclosure by Gardner et al. raised source and drain with second extender layer of source and drain.

Natzle et al. ( in fig 5C) teach how to fabricate a structure with raised source and drain

It would have been obvious to one of ordinary skill in the art the time the invention was made to use the raised source and drain with second extender layer of source and drain ( as disclosed by Natzle in the Gardner device and come up with the invention of claim 7,8,9.

The Rationale is as the following:

A person skilled in the art at the time the invention was made would have been motivated to improved the Gartner device using a raised source and drain to take advantage of this structure as suggested by Natzle et al. thorough his disclosure ( in particular in column 2 lines 55-67).

**11. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thinh T Nguyen whose telephone number is 571-272-1790. The examiner can normally be reached on 9:30 am - 6:30 pm Monday to Friday..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID NELMS can be reached on 571-272-1787. The fax phone numbers for the organization where this application or proceeding is assigned is 571-273-8300

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval [ PAIR ] system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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